

Off-The-Shelf Quantum Cascade IR Lasers



Readily available, off-the shelf
Multiple Wavelengths

- Continuous-wave output
- Single-Mode (DFB)
- Guaranteed output power
- Standard tuning range (wavelength dependant)
- HHL housing
- Collimated beam output

Boston Electronics and Alpes Lasers offer a series of off-the-shelf QCL lasers. The lasers are standard lasers taken from some of Alpes' most popular products. They are pre-encapsulated and respect standard performance levels:

- Continuous-wave output
- Single-Mode (DFB)
- Guaranteed output power
- Standard tuning range (wavelength dependent)
- HHL housing
- Collimated beam output

These lasers are ready for immediate shipment and can be obtained at a low price with a lead time of 2 weeks in most cases for small quantities (up to 3). For larger quantities please contact us directly! qcl@boselec.com

They can also be purchased directly through our Web Store:

<https://shop.boselec.com/collections/quantum-cascade-laser-qcl>

Currently available OTS lasers (5/26):

Part #	Center wave number	Min. power at Center Wavelength	Tuning Range
CW-SM-Q-1030-15-0.9-HHL-L	1030 cm ⁻¹	> 15 mW	> 3 cm ⁻¹
CW-SM-Q-1046.3-5-1-HHL-L	1046.3 cm ⁻¹	> 5 mW	> 2 cm ⁻¹
CW-SM-Q-1103.5-20-0.8-HHL-L	1103.5 cm ⁻¹	> 20 mW	> 3 cm ⁻¹
CW-SM-Q-1900-5-0.5-HHL-L	1900 cm ⁻¹	> 5 mW	> 2 cm ⁻¹
CW-SM-Q-2209-15-1-HHL-L	2209 cm ⁻¹	> 15 mW	> 3 cm ⁻¹
CW-SM-Q-2311-10-1-HHL-L	2311 cm ⁻¹	> 10 mW	> 4 cm ⁻¹

CW Single Mode Laser / CW-SM-Q-1030-15-0.9-HHL-L

CW Single Mode Lasers (or CW-DFB lasers) are able to emit a single wavelength at a time. They can be tuned within a range that can reach up to 10 cm^{-1} ; there exists a variety of modulation schemes which can be used for different purposes. Single Mode Lasers are mostly used for spectroscopy. To be operated in continuous-wave (CW).

Specifications for CW-SM-Q-1030-15-0.9-HHL-L	
Laser type	QCL quantum-cascade laser
Laser Far-field	TM00
Operating mode	CW continuous wave
Emission type	SM singlemode
Target frequency [cm^{-1}]	1030.0 \pm 0.0
Avg optical power [mW]	15.0
Full Tuning [cm^{-1}]	0.9
Temperature Reachable Range [cm^{-1}]	3.0
Is Centered	No
Package Interface	HHL-L
Heatsink temperature max [$^{\circ}\text{C}$]	20
Fabrication time [days]	10

Definitions	
Laser far-field	Spatial mode of the laser in the far field.
Operating mode	Operating mode of the driver electronics.
Emission type	Spectral behavior of the laser.
Target frequency [cm^{-1}]	Target single-mode emission frequency.
Avg optical power [mW]	Average optical power at target emission frequency.
Full Tuning [cm^{-1}]	Emission tuning range accessible by changing the current while keeping the temperature fixed.
Temperature Reachable Range [cm^{-1}]	Emission tuning range from threshold at lowest temperature to maximum current at maximum temperature.
Package interface	Laser packaging: either on ceramic submount, or on copper submount, or in specific housing.
Heatsink temperature [$^{\circ}\text{C}$]	Maximum temperature of the heatsink on which the package will be fixed.

CW Single Mode Laser / **CW-SM-Q-1046.3-5-1-HHL-L-V5**

CW Single Mode Lasers (or CW-DFB lasers) are able to emit a single wavelength at a time. They can be tuned within a range that can reach up to 10 cm^{-1} ; there exists a variety of modulation schemes which can be used for different purposes. Single Mode Lasers are mostly used for spectroscopy. To be operated in continuous-wave (CW).

Specifications for CW-SM-Q-1046.3-5-1-HHL-L-V5	
Laser type	QCL quantum-cascade laser
Laser Far-field	TM00
Operating mode	CW continuous wave
Emission type	SM singlemode
Target frequency [cm^{-1}]	1046.3 \pm 0.0
Avg optical power [mW]	5.0
Full Tuning [cm^{-1}]	1.0
Temperature Reachable Range [cm^{-1}]	2.0
Is Centered	No
Package Interface	HHL-L
Heatsink temperature max [$^{\circ}\text{C}$]	25
Minimum Voltage [V]	7.0
Maximum Voltage [V]	14.0
Minimum Current [mA]	50.0
Maximum Current [A]	1.2
Fabrication time [days]	70

Definitions	
Laser far-field	Spatial mode of the laser in the far field.
Operating mode	Operating mode of the driver electronics.
Emission type	Spectral behavior of the laser.
Target frequency [cm^{-1}]	Target single-mode emission frequency.
Avg optical power [mW]	Average optical power at target emission frequency.
Full Tuning [cm^{-1}]	Emission tuning range accessible by changing the current while keeping the temperature fixed.
Temperature Reachable Range [cm^{-1}]	Emission tuning range from threshold at lowest temperature to maximum current at maximum temperature.
Package interface	Laser packaging: either on ceramic submount, or on copper submount, or in specific housing.
Heatsink temperature [$^{\circ}\text{C}$]	Maximum temperature of the heatsink on which the package will be fixed.
Minimum Voltage	Low end of the potential range for the operation voltage
Maximum Voltage	High end of the potential range for the operation voltage
Minimum Current	Low end of the potential range for the operation current
Maximum Current	High end of the potential range for the operation current

CW Single Mode Laser / CW-SM-Q-1103.5-20-0.8-HHL-L

CW Single Mode Lasers (or CW-DFB lasers) are able to emit a single wavelength at a time. They can be tuned within a range that can reach up to 10 cm^{-1} ; there exists a variety of modulation schemes which can be used for different purposes. Single Mode Lasers are mostly used for spectroscopy. To be operated in continuous-wave (CW).

Specifications for CW-SM-Q-1103.5-20-0.8-HHL-L	
Laser type	QCL quantum-cascade laser
Laser Far-field	TM00
Operating mode	CW continuous wave
Emission type	SM singlemode
Target frequency [cm^{-1}]	1103.5 \pm 0.0
Avg optical power [mW]	20.0
Full Tuning [cm^{-1}]	0.8
Temperature Reachable Range [cm^{-1}]	3.0
Is Centered	No
Package Interface	HHL-L
Heatsink temperature max [$^{\circ}\text{C}$]	25
Minimum Voltage [V]	7.0
Maximum Voltage [V]	14.0
Minimum Current [mA]	50.0
Maximum Current [A]	1.2
Fabrication time [days]	56

Definitions	
Laser far-field	Spatial mode of the laser in the far field.
Operating mode	Operating mode of the driver electronics.
Emission type	Spectral behavior of the laser.
Target frequency [cm^{-1}]	Target single-mode emission frequency.
Avg optical power [mW]	Average optical power at target emission frequency.
Full Tuning [cm^{-1}]	Emission tuning range accessible by changing the current while keeping the temperature fixed.
Temperature Reachable Range [cm^{-1}]	Emission tuning range from threshold at lowest temperature to maximum current at maximum temperature.
Package interface	Laser packaging: either on ceramic submount, or on copper submount, or in specific housing.
Heatsink temperature [$^{\circ}\text{C}$]	Maximum temperature of the heatsink on which the package will be fixed.
Minimum Voltage	Low end of the potential range for the operation voltage
Maximum Voltage	High end of the potential range for the operation voltage
Minimum Current	Low end of the potential range for the operation current
Maximum Current	High end of the potential range for the operation current

CW Single Mode Laser / CW-SM-Q-1900-5-0.5-HHL-L-V4

CW Single Mode Lasers (or CW-DFB lasers) are able to emit a single wavelength at a time. They can be tuned within a range that can reach up to 10 cm^{-1} ; there exists a variety of modulation schemes which can be used for different purposes. Single Mode Lasers are mostly used for spectroscopy. To be operated in continuous-wave (CW).

Specifications for CW-SM-Q-1900-5-0.5-HHL-L-V4	
Laser type	QCL quantum-cascade laser
Laser Far-field	TM00
Operating mode	CW continuous wave
Emission type	SM singlemode
Target frequency [cm^{-1}]	1900.0 \pm 0.0
Avg optical power [mW]	5.0
Full Tuning [cm^{-1}]	0.5
Temperature Reachable Range [cm^{-1}]	2.0
Is Centered	No
Package Interface	HHL-L
Heatsink temperature max [$^{\circ}\text{C}$]	20
Minimum Voltage [V]	7.0
Maximum Voltage [V]	14.0
Minimum Current [mA]	50.0
Maximum Current [A]	1.2
Fabrication time [days]	56

Definitions	
Laser far-field	Spatial mode of the laser in the far field.
Operating mode	Operating mode of the driver electronics.
Emission type	Spectral behavior of the laser.
Target frequency [cm^{-1}]	Target single-mode emission frequency.
Avg optical power [mW]	Average optical power at target emission frequency.
Full Tuning [cm^{-1}]	Emission tuning range accessible by changing the current while keeping the temperature fixed.
Temperature Reachable Range [cm^{-1}]	Emission tuning range from threshold at lowest temperature to maximum current at maximum temperature.
Package interface	Laser packaging: either on ceramic submount, or on copper submount, or in specific housing.
Heatsink temperature [$^{\circ}\text{C}$]	Maximum temperature of the heatsink on which the package will be fixed.
Minimum Voltage	Low end of the potential range for the operation voltage
Maximum Voltage	High end of the potential range for the operation voltage
Minimum Current	Low end of the potential range for the operation current
Maximum Current	High end of the potential range for the operation current

CW Single Mode Laser / CW-SM-Q-2209-15-1-HHL-L

CW Single Mode Lasers (or CW-DFB lasers) are able to emit a single wavelength at a time. They can be tuned within a range that can reach up to 10 cm⁻¹; there exists a variety of modulation schemes which can be used for different purposes. Single Mode Lasers are mostly used for spectroscopy. To be operated in continuous-wave (CW).

Specifications for CW-SM-Q-2209-15-1-HHL-L	
Laser type	QCL quantum-cascade laser
Laser Far-field	TM00
Operating mode	CW continuous wave
Emission type	SM singlemode
Target frequency [cm ⁻¹]	2209.0 ± 0.0
Avg optical power [mW]	15.0
Full Tuning [cm ⁻¹]	1.0
Temperature Reachable Range [cm ⁻¹]	3.0
Is Centered	No
Package Interface	HHL-L
Heatsink temperature max [°C]	20
Minimum Voltage [V]	7.0
Maximum Voltage [V]	14.0
Minimum Current [mA]	50.0
Maximum Current [A]	1.2
Fabrication time [days]	56

Definitions	
Laser far-field	Spatial mode of the laser in the far field.
Operating mode	Operating mode of the driver electronics.
Emission type	Spectral behavior of the laser.
Target frequency [cm ⁻¹]	Target single-mode emission frequency.
Avg optical power [mW]	Average optical power at target emission frequency.
Full Tuning [cm ⁻¹]	Emission tuning range accessible by changing the current while keeping the temperature fixed.
Temperature Reachable Range [cm ⁻¹]	Emission tuning range from threshold at lowest temperature to maximum current at maximum temperature.
Package interface	Laser packaging: either on ceramic submount, or on copper submount, or in specific housing.
Heatsink temperature [°C]	Maximum temperature of the heatsink on which the package will be fixed.
Minimum Voltage	Low end of the potential range for the operation voltage
Maximum Voltage	High end of the potential range for the operation voltage
Minimum Current	Low end of the potential range for the operation current
Maximum Current	High end of the potential range for the operation current

CW Single Mode Laser / CW-SM-Q-2311-10-1-HHL-L

CW Single Mode Lasers (or CW-DFB lasers) are able to emit a single wavelength at a time. They can be tuned within a range that can reach up to 10 cm⁻¹; there exists a variety of modulation schemes which can be used for different purposes. Single Mode Lasers are mostly used for spectroscopy. To be operated in continuous-wave (CW).

Specifications for CW-SM-Q-2311-10-1-HHL-L	
Laser type	QCL quantum-cascade laser
Laser Far-field	TM00
Operating mode	CW continuous wave
Emission type	SM singlemode
Target frequency [cm ⁻¹]	2311.0 ± 0.0
Avg optical power [mW]	10.0
Full Tuning [cm ⁻¹]	1.0
Temperature Reachable Range [cm ⁻¹]	4.0
Is Centered	No
Package Interface	HHL-L
Heatsink temperature max [°C]	20
Minimum Voltage [V]	7.0
Maximum Voltage [V]	14.0
Minimum Current [mA]	50.0
Maximum Current [A]	1.2
Fabrication time [days]	56

Definitions	
Laser far-field	Spatial mode of the laser in the far field.
Operating mode	Operating mode of the driver electronics.
Emission type	Spectral behavior of the laser.
Target frequency [cm ⁻¹]	Target single-mode emission frequency.
Avg optical power [mW]	Average optical power at target emission frequency.
Full Tuning [cm ⁻¹]	Emission tuning range accessible by changing the current while keeping the temperature fixed.
Temperature Reachable Range [cm ⁻¹]	Emission tuning range from threshold at lowest temperature to maximum current at maximum temperature.
Package interface	Laser packaging: either on ceramic submount, or on copper submount, or in specific housing.
Heatsink temperature [°C]	Maximum temperature of the heatsink on which the package will be fixed.
Minimum Voltage	Low end of the potential range for the operation voltage
Maximum Voltage	High end of the potential range for the operation voltage
Minimum Current	Low end of the potential range for the operation current
Maximum Current	High end of the potential range for the operation current

Laser Diode Controllers

6300 SERIES COMBOSOURCE LASER DIODE CONTROLLERS

The **6300 Series ComboSource** Laser Diode Controller offers the best of both worlds: a high accuracy, low noise laser driver and a powerful 60W temperature controller, all in one compact instrument.

The **6300 ComboSource** was born from the proven technology of our LaserSource and TECSource products, and includes several improvements making it our flagship product, providing outstanding performance at a price that does not kill your budget.



6300 Quick Specifications

Model	Milli-Amps	Volts	Laser Connector	QCL
6301	50 / 100	10	DB9	
6305	250 / 500	10	DB9	
6310	500 / 1000	10	DB9	
6340	2000 / 4000	4	DB9	
6310-QCL	500 / 1000	18	DB9	●
6340-QCL	2000 / 4000	15	DB9	●

General Specifications

TEC Power, Connector	5A / 12V / 60W, DB15
Sensors Supported	Thermistor, RTD, LM335, AD590
Remote Interfaces	USB and RS-232
Size (HxWxD) [in (mm)]	3.5 (90) x 8.5 (215) x 12 (305)

Easy to Use, Easy to Configure

Like all our products, you'll find the user interface is easy to setup and use. A dot-pixel character display allows for human-readable status, readings, and errors. No longer do you need to get out the manual to figure out how to set the current limit, or to understand what error 114 is; you can read it directly on the display in plain English. Want to see big numbers from across the room? No problem. Want to see actual versus set point, voltage, and current...all at once? You can do that, too. With a configurable display you can make the instrument work the way you want it to. Its compact form factor means the **ComboSource** takes up less room on your test bench, and the USB and RS-232 computer interfaces make it easy to integrate into your existing test systems.

At a Glance

100mA to 4 Amps
60 Watt TEC
Low noise, dual range
Advanced laser protection
Computer Interface

User Function Keys

The user function keys can be used to quickly select different configuration states or execute a predefined set of commands. Switch between two different experiments or script repetitive actions...anything you can do manually with the instrument can be programmed to the function key.

High Performance Temperature Control

In addition to being an excellent laser driver, the **ComboSource** also functions as a high performance temperature controller. Sixty watts of output power and fully adjustable PID control make it suitable for a wide range of applications.

Dual Range Operation & 4-Wire Sense

The **ComboSource** features dual current operating ranges for improved noise and accuracy for lower current applications without sacrificing headroom for your more power powerful devices. The **ComboSource** also has 4-wire sense for accurate device voltage measurements. This eliminates voltage errors caused by cable and connector resistances.

Full Isolation Means No Ground Loops

Beyond the expected laser protection features, the **ComboSource** adds something unique to the Arroyo family of products: optical isolation of the modulation and photo diode inputs (the computer interfaces are also isolated). This protects against unwanted ground loops and other electrical disturbances that can plague traditional instruments and damage lasers. No other driver on the market has this capability.

Enhanced QCL Capabilities

The **6310-QCL** and **6340-QCL** Controllers are designed to operate at the higher compliance voltages required by QCL lasers.

Independent, Isolated Outputs

With multiple, independent power supplies, the **ComboSource** operates the laser and temperature controller outputs fully independent of each other, with full electrical isolation.

260 SERIES**HIGH-POWER
LASERMOUNTS**

The 260 series LaserMounts are designed to provide high performance and long term operation. Wire harnesses for various types of lasers are available. Each 260 Series mount can be bolted to an optical table or work surface using holes matching the 1" centers of most optical tables.

**CUSTOMIZABLE COPPER COLD PLATE**

100% copper cold-plate with mounting holes for common lasers and LEDs, and hard nickel plating for maximum performance and scratch resistance. **Custom mounting configurations available.**

**PASSIVE COOLING (MODEL 262)**

Take advantage of the 0.25°C-per-Watt cooling efficiency of the Model 262 to maintain low package temperatures.

**ACTIVE HEATING AND COOLING (MODEL 264)**

The 264 LaserMount includes a built-in Peltier device and temperature sensor for bi-polar temperature control.

**STANDARDIZED CABLE CONNECTORS**

Connect to Arroyo Instruments laser drivers and temperature controllers with standard cables.

**NITROGEN PURGE (OPTIONAL)**

The optional 260-C cover with available 1/8" barbed nozzle adapts to a nitrogen supply to eliminate condensation around the laser device.

AT-A-GLANCE

Mounting Plates

- ▶ All Copper Design
- ▶ Breadboard or Multi-Device
- ▶ Customizable Mounting Holes

Cooling Mode

- ▶ Passive Cooling (Model 262)
- ▶ Active Heating & Cooling (Model 264)

Thermal Capacity

- ▶ 0.25°C/W (Model 262)
- ▶ 30 Watts (Model 264)

Also Includes

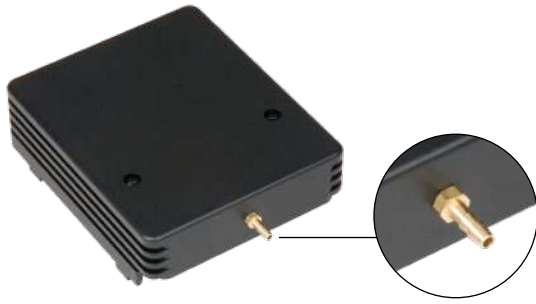
- ▶ Integrated Fan
- ▶ Optional Laser Harness

**OPTIONAL HIGH
TEMPERATURE**

The 260 Series mounts are available in an optional high temperature configuration, allowing for operation up to 150°C, but retaining the temperature range and thermal capacity of the standard mount. Because thermistors do not perform well at high temperatures, the sensor is replaced with a high accuracy Pt100 RTD sensor.

Contact the factory for a quote.

ACCESSORIES



260-C

COVER FOR 260 SERIES MOUNTS

For applications that need a very stable response or protection of the device, the 260-C is a custom designed cover that fits snugly on top of the fixture, and includes a $\frac{1}{8}$ " barbed nitrogen purge nipple.

RECOMMENDED CONTROLLERS AND CABLES

The right temperature controller for your application depends on the mount and temperature range your application requires:

MODEL 262

5240 or 5305 (depending on laser module requirement) and 1260B cable

MODEL 264

5305 and 1260B cable.

MODEL 264, 150°C

5300-04-15 and 1260B cable, or
5300-08-24 and 1262B cable



Boston Electronics are exclusive North American Technical Sales Agents for Tunable Infrared Quantum Cascade Lasers from Alpes Lasers SA of Switzerland. Alpes Lasers was the first QCL company in the world and offers a variety of QCLs which differ in semiconductor architecture and intended use. This sheet is intended to help you understand the available options and make your choice quicker and easier.

Spectroscopy Grade, Tunable	DFBs	Extremely narrow linewidths tune over a narrow spectral range with high resolution (usually $< 1 \text{ cm}^{-1}$) with milliwatts of power for Beer's Law measurements.
	Extended tuning range DFBs	-XT and -ET series devices with embedded chip features to allow rapid tuning over $> 5 \text{ cm}^{-1}$ or wider - tuning (to $> 2\%$ of center wavelength)
	External Cavities	Extended tuning up to 300 cm^{-1} with linewidths and of 1 cm^{-1} and pulsed operation at mW average power levels
	Frequency Combs	Simultaneous measurement of high-resolution spectra over $> 50 \text{ cm}^{-1}$ enabled by this concept
Compact IR Sources at arbitrary wavelengths	Fabry Perots	Emission bands (gain profiles) from 50 to $> 300 \text{ cm}^{-1}$. Power levels from 10s of mW to $> 1.5\text{W}$ average or $> 20\text{W}$ peak. Applications include chips for external cavities, IR communications and IRCM.

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CW-SM-Q-1046.3-5-1-HHL-L	1046.3 cm ⁻¹	> 5 mW	> 2 cm ⁻¹
CW-SM-Q-1103.5-20-0.8-HHL-L	1103.5 cm ⁻¹	> 20 mW	> 3 cm ⁻¹
CW-SM-Q-1900-5-0.5-HHL-L	1900 cm ⁻¹	> 5 mW	> 2 cm ⁻¹
CW-SM-Q-2209-15-1-HHL-L	2209 cm ⁻¹	> 15 mW	> 3 cm ⁻¹
CW-SM-Q-2311-10-1-HHL-L	2311 cm ⁻¹	> 10 mW	> 4 cm ⁻¹